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ABSTRACT

This workshop manual is intended for groups in the workplace. It leads the group step-by-step through problem-solving techniques based on both critical and creative thinking approaches to describe, analyze, plan, and act on a realistic shared understanding of the real problem and workable solutions. It begins with a problem-solving curriculum outline for the four steps of systematic problem solving: (1) describing the problem; (2) analyzing the cause; (3) finding solutions; and (4) action planning. It includes information sheets, questions to ask, and forms to fill in. (KC)

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ITRON

WORKPLACE IMPROVEMENT OF NECESSARY SKILLS

WINS

PROBLEM SOLVING

INSTRUCTOR: RAMONA ANDERSON

U.S. DEPARTMENT OF EDUCATION
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COMMUNITY COLLEGES OF SPOKANE

Dear Participants,

During the last ten years our workplace changes and challenges have been many as we moved towards acceleration of technology and customization of products and services.

How does this affect us? It means we are continuously learning and finding new ways to do the work we have done before.

The object of this training is to support and supplement the skills you have learned in school, on the job and in prior work experiences. You already have many skills and will continue to add to those skills through this course and other courses throughout your lifetime. That is why workplace learning has now become a continuous process for each and every one of us.

This training program began with Conflict Resolution. It continues now with Problem Solving and Quality Improvement. Other new workplace skill classes will be offered in the coming year both through this grant (Workplace Improvement of Necessary Skills) and within Itron's overall organizational training goals.

You have become a continuous learner. What new learning goals do you have for yourself this month, this year, in the next five years? Take a few minutes during this course to set some learning goals for yourself. Check in from time to time to see if you are meeting your goals.

In order to problem solve it is first necessary to prioritize. As you get to know the four step problem solving process, you will begin to notice your ability to identify the real problems increasing and your time to work the process growing shorter. Problem solving can be very valuable to us when it helps us find better ways to do our work while increasing our awareness of the part we play in our own learning process.

Learning is continuous.....

Sincerely,

Susan K. Johnson

Susan K. Johnson
WINS Grant Site Director

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RELATING PROBLEM SOLVING TO ITRON'S CORRECTIVE ACTION MANAGEMENT PROGRAM C. A. M. P.

C.A.M.P. provides a systematic means for ITRON employees to correct internal or external customer hardware issues, and to provide a quality record of these corrections.

Sometimes problems are only technical and once resolved, stay resolved.

Sometimes problems, even technical problems, are symptoms of deeper problems resulting from poor communication between parts of the organization, lack of clear accountability, inadequate training or other more difficult and hidden causes.

Like the C.A.M.P. system, this model describes the problem and gathers information. It then assigns responsibility for both corrective and preventive action followed by monitoring and assessment - was the root cause fixed?

This problem solving model gives you some additional tools, particularly in the first stages to correctly identify the root causes of the problem. These tools are especially useful for difficult problems that keep happening despite actions taken.

The time and effort taken by a team or committee are worth the investment when there is:

- agreement the "costs" (human, economic, etc.) are high if the problem continues;
- agreement that "investment" of time, energy, and resources is appropriate;
- there is the needed support by the organization (including management) to fully implement the solutions and monitor and support the action planned.

PROBLEM SOLVING CURRICULUM OUTLINE

STEP	PURPOSE	TOOLS	OUTPUT
DESCRIBING THE PROBLEM	Selecting problem/opportunity Developing a symptom list Analyzing the symptons Identifying the real problem	Multivoting Nominal Grouping Brainstorming Data Collection	ROOT CAUSE
ANALYZING THE CAUSE	Developing a list of causes Categorizing Analyzing causes Identifying the root cause	Brainstorming Cause & Effect Analysis Repetitive "Why"? Analysis Chronolgical Analysis	PROBLEM DESCRIPTION
FINDING SOLUTIONS	Setting goals Developing options Evaluating options Consensus on solution(s)	Visioning Force Field Analysis Ranking Rating	SUPPORTABLE SOLUTIONS
ACTION PLANNING	Developing action steps Organizing actions Setting up controls Establishing a workable plan	Brainstorming Force Field Analysis Action Plan Form Monitoring Techniques Action Plan Self-Test	IMPLEMENTATION PLAN

FOUR STEPS TO SYSTEMATIC PROBLEM SOLVING

INTRODUCTION: 1 - 4

Selection of a group problem as a basis for practicing the step-by-step problem solving. Each of stage has a variety of tools or techniques. The outcome is carried forward to the next step of the problem solving process.

Setting Priorities using
- Multi-voting or
- Nominal group technique

STEP 1: IDENTIFYING THE REAL PROBLEM 5 - 11

TOOLS:
- A. Symptom Identification
  - Brainstorming
  - Symptom List
- B. Analyzing the Symptoms
- C. Data Collection Process

RESULT: Consensus on description of problem

STEP 2: ANALYZING THE CAUSE OF THE PROBLEM 12 - 20

TOOLS:
- A. Brainstorming
- B. Cause & Effect Diagram
- C. Repetitive "Why?" Analysis
- D. Chronological Analysis

RESULT: Conclusions on the root cause of the problem

Revised 3/19/96

STEP 3: FINDING SOLUTIONS TO THE PROBLEM 21 - 30

TOOLS:

Part I. Goal Setting
Part II. Developing Options
- A. Brainstorming
- B. Force Field Analysis
- C. Analyzing the Options

Part III. Evaluating the Options
- A. Eliminating
- B. Ranking
- C. Rating

RESULT: Consensus on solution(s) selected from alternatives

STEP 4: ACTION PLANNING 31 - 40

TOOLS:

Force Field Analysis
Brainstorming
Categorizing
Action Plan Form
Monitoring Techniques
Action Plan Test

RESULT: A workable, self-correcting implementation plan.

INTRODUCTION

If problems in organizations and work teams were easy to solve, we would not spend so much time avoiding them or trying to fix blame. In truth the real issues behind problems are often unseen or unknown and difficult to discover. Consequently, many of our solutions fix the symptoms, much like taking an aspirin for a headache. We get temporary relief and soon enough the symptoms return!

This workshop is intended for groups in the workplace. Step-by-step the group works through problem solving techniques based on both critical and creative thinking approaches to describe, analyze, plan and act on a realistic shared understanding of the real problem and workable solutions.

WHAT IS A PROBLEM?

A DILEMMA WITH NO WAY OUT

A SITUATION WITHOUT AN APPARENT SOLUTION

THINGS AREN'T THE WAY YOU'D LIKE THEM TO BE

The foundation of the workshop is a problem or dilemma selected by the group in the following exercise:

SELECTING A PROBLEM

Instructions:

1. **Jot down some ideas you have that seem like problems the group would like to solve.**

Criteria

You are willing to disclose the problem to others and discuss it openly.
The problem will be of interest to others as well as yourself.
You would benefit from taking the time to work on it.
The problem does not have obvious solutions you have implemented.
You can participate in the solution at least to some extent.

2. **Share your ideas with your group, having a recorder put them on newsprint or the board.**

3. **Select the problem most important to the group by using one of the techniques on the next pages - Multivoting or Nominal Group.**

Either approach will allow your group to collectively decide which is the most important item on the list. It saves time when a decision needs to be made and the group does not want to get bogged down in discussions or debate about what is most important. Each opinion is represented.

4. **Write the problem selected by the group as you see it in the space below.**

TECHNIQUES FOR SETTING PRIORITIES

A. MULTIVOTING TECHNIQUE - useful for long lists or large groups

1. Count the number of items on the list
2. Give each person half the number of votes
3. Each person is free to assign his/her votes in any manner.
4. Mark the items on the list.
5. Select top item, or discuss several top items before final choice.

Example

	Person										
Work related problems	A	B	C	D	E	F	G	H	I	J	Total
1. Poorly run meetings	1	1				1		2		1	6
2. Cross training missing	3		4	2	4	1		2		1	17
3. Coordination with night shift		1		2			2				5
4. High cafeteria prices							1				1
5. Trouble makers on line									2		2
6. Getting heard by management						2					2
7. Equipment breakage		1					1			1	3
8. Shortages in parts		1							2	1	4

10 people, 4 points each

Decision: To work on issues related to getting teams cross-trained.

B. NOMINAL GROUP TECHNIQUE for setting priorities by average ranking

1. Assign each idea a letter
2. Have each group member write the letters on a piece of paper.
3. Ask each member to prioritize the list by writing a number beside each letter.
   a. For ten ideas, the least important would be assigned a 1 and the most important would be assigned a 10.
   b. Each number must be used only once.
4. For each letter, total the numbers from all group members.
5. The highest priority item will have the highest total, the least important will have the lowest total.

Example

Problem	Person					Total	Priority
	1	2	3	4	5		
A	6	5	7	5	6	29	#2
B	3	2	4	1	3	13	#5
C	1	2	4	1	3	8	#7
D	4	4	5	6	4	23	#4
E	7	7	6	7	5	32	#1
F	2	3	1	3	1	10	#6
G	5	6	3	4	7	25	#3

7 topics ranked by 5 people

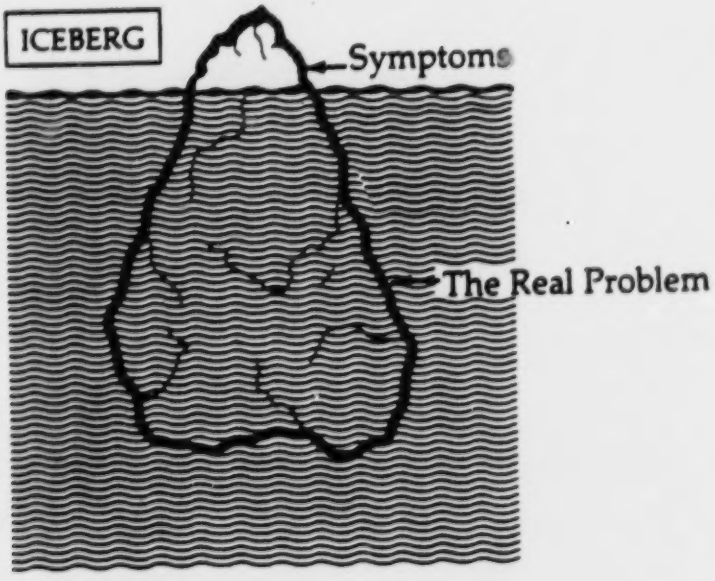
Decision: Work on Problem E or discuss A, G, E based on merits. Rewrite detailed explanation and then vote.

STEP 1. DESCRIBING THE PROBLEM

Stuck - got a problem that won't go away?
Are you in a situation that needs fixing?
It isn't what is should be - or could be? It isn't what you want it to be?
Is it worth the time and effort to fix?

90% OF SOLVING A PROBLEM IS KNOWING WHAT THE REAL PROBLEM IS!

We tend to jump in to solve a problem before we know what it is. Usually what we "know" are the symptoms - "the tip of the iceberg"! Remember the 80/20 rule. No matter how large the tip of an iceberg seems, 80% of it lies below the surface of the water. You have to be patient.



The first step is to recognize that a situation needs resolving; it is a recurring problem. No matter how serious or stressful the encounter is, it is only a symptom of the underlying trouble or real problem. It is important to understand what you know about the problem, those things that occur that are most visible, most frustrating, are and are not working.

A. SYMPTOM IDENTIFICATION TECHNIQUE

The **Symptom List** is a simple form used to tabulate all the visible signs, consequences, and effects of the problem. It is compiled by brainstorming and listing the initial information and perceptions of everyone involved. The purpose of the list is to uncover all the initial viewpoints of the situation....what the problem is and what it is not.

DESCRIBING THE PROBLEM

Instructions:

1. *Select a recorder. If your group is over ten also select a facilitator.*
2. *Write the problem on newsprint or the board.*
3. *Give everyone a few minutes to jot down as many ideas as they can think of on their Symptom List (below)*
4. *If your group is large or new to each other, use a Round Robin to share your ideas going around the room one at a time until there are no more new ideas to add.*
5. *If your group is smaller and all are quite vocal, just have people call out their ideas until there are no more new ideas to add. Do not evaluate or comment on the ideas presented.*

Symptom List (my description):

B. ANALYZING THE SYMPTOMS

Described in the Symptoms List are different "faces" of the same problem. We need to simplify our list by "clustering" or categorizing related symptoms. Look at the list generated by your group. What patterns, themes, relationships do you see? Some possibilities might include interpersonal problems, technical problems, political problems, scheduling problems, equipment & supply problems, quality issues, communication problems, or training problems.

By grouping the symptoms you begin to get a clearer picture of the issue or problem. You may even identify some important parts of the problem you forgot to describe! Add them. OR you may find your symptom so general, it could mean many things (such as POOR COMMUNICATION). This is also an opportunity to rephrase very general descriptions into more specific descriptions - - communication about what, between whom, for what purpose?

This is a "work in progress." Each step adds more and more clarity as you differentiate between what the problem is, and what it is not.

ANALYZING THE SYMPTOMS

Instructions:

1. *Start with the Symptoms List your group has developed to describe the problem. The simplest approach is to go through the list identifying a larger category that the symptom is a part of. Using a different color pen, write the category in the left margin. This may be done as a group as a whole or in subgroups. Consider this a "draft." An alternative (if the list is on one board or one paper) is to draw arrows between related items. There is room on the next page to write down your own ideas before the group exercise.*

2. *Now restructure and summarize your Problem Description. Group the symptoms by category. Has the original problem area become more clear? Can the group now write a more detailed problem statement?*

3. *Review the problem statement you wrote on page 4. Rewrite the statement on the worksheet on the next page under REVISED PROBLEM STATEMENT. It is sometimes helpful to rewrite it several different ways. Come to a consensus in the group regarding the new statement.*

My ideas for categories to group the symptoms:

Possible reframed problem statements for consideration:

C. THE DATA COLLECTION PROCESS

In the Symptoms List you collected everything you could think of "off the top of your head." Next you need to identify **general information** you need about the problem that is missing. Then you need to decide **specific target data** - - where the information is and in what form. Once the data has been collected, it must be analyzed for information about the problem and summarized in a presentation for the problem solving group.

There is not time to actually collect data in this workshop. You can, however, brainstorm general information you need and identify where you might find this information or how it might be gathered. On following page the **Sample Target Data** and the **Data Collection Method** list will give you some ideas.

Category/Symptom	General Information Needed	Specific Target Data

General Information Needed to Define the Problem

- What production statistics, quality statistics, financial statistics exist that would help us measure the problem?
- Do organizational strategies, policies, procedures, job descriptions, or training effect this problem? If so, which ones?
- Do "people skills" such as communication skills, team skills, management styles, moral, job skills affect the problem?
- Are there factors outside the workplace that significantly affect this problem? - Vendors, labor pool, market conditions, competitors, government regulation?

Target Data

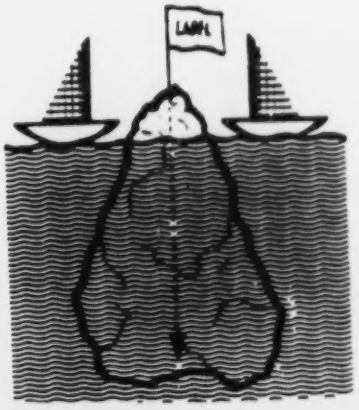
- Specifically, *who, what, where, when, how* can you find this information?

Hard Data	Soft Data
Facts, results, events, history, statistics forces, goals, procedures, physical phenomena, observable deviations, time factors, trends, productivity, quality and performance levels Reports Statistics Expenditures/Costs Time Space Inventory Personnel Strategic Planning Policies Procedures Contracts Legal Restriction Sampling Technical, professional sources	Feelings, opinions, human factors, frictions, attitudes, satisfaction levels, stresses, frustrations, personality conflicts, behaviors, hearsay, intuition, "gut" reactions, mental blocks Surveys Interviews Observations Focus groups Meeting reports

COMPLETING STEP 1

You now have a wealth of information. What do you do with "IT"?

Back to our iceberg. People in each lifeboat view the obstacle that sunk their ocean liner from different angles. WHEN THIS OCCURS, IT IS NOT POSSIBLE TO AGREE ON DESCRIPTIONS. A problem looks different from different vantage points. Differences in opinion about details or major issues can block necessary teamwork to resolve things. ALL VIEWPOINTS MUST AGREE ON WHAT IS TO BE SOLVED.



GROUP CONSENSUS ON PROBLEM

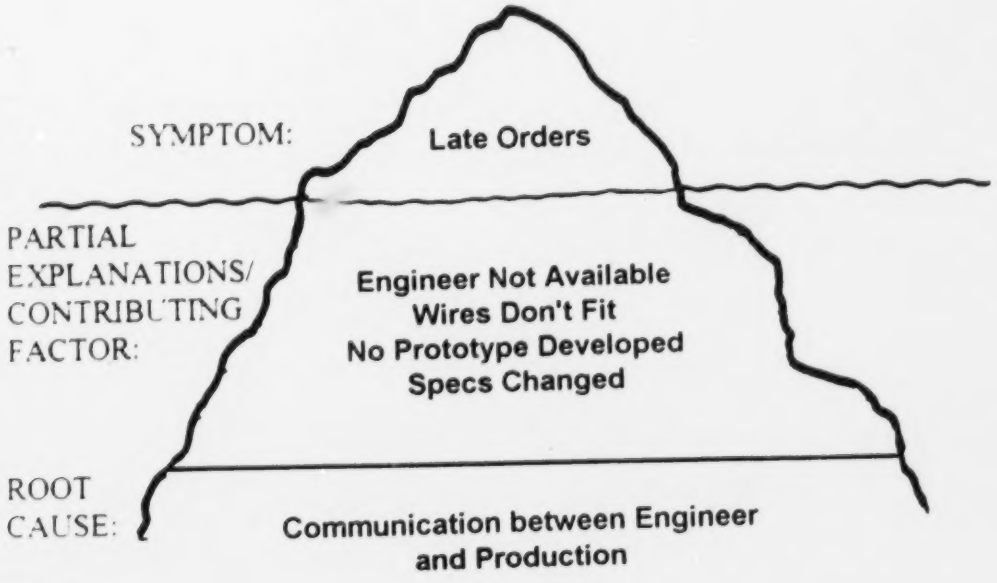
Instructions:

1. *Have each individual read their most recent problem statement. Note the key points on newsprint or the board.*
2. *Identify the areas of agreement and differences.*
3. *Discuss the differences.*
4. *Identify and label all sides in a way that everyone can accept the key issues.*
5. *Write a statement of what is to be solved.*

STEP 2. THE PROBLEM-CAUSE ANALYSIS

The previous step helped create a general awareness of what the problem is and is not. Step 2 looks for the root cause of the problem. The **root cause is the pivotal reason that started the problem in the first place and must be dealt with in order to find a long-term workable solution.**

In the example below the most recent and visible symptoms are at the top and the more fundamental causes below. The timeline can be read from the bottom up. If this snowballing series of events were openly examined, the problem could be cleared up with no permanent damage.



A. BRAINSTORMING

Begin your list of potential root causes with brainstorming. Possible questions to use as your focal point are:

"What caused the problem?"
"Why does the problem exist?"
"Where did it start and where did it come from?"
Why doesn't it resolve itself or just go away?"
"What caused it in the first place?"
"What changed right before things got messed up?"
"Why do you keep getting sucked back into the situation?"
"Why won't things improve no matter what?"

At this point we are working with ideas, not facts. Your opinions, instincts, guesses all count. There is no right or wrong. Later we will analyze the ideas to get at the root cause.

POSSIBLE CAUSES

Instructions:

1. *Select a facilitator/recorder.*
2. *Review the problem to be solved.*
3. *Have each member of the group read through the list of questions above and write their own thoughts at the bottom of this page.*
4. *Using newsprint or a board write the title "Possible Causes" at the top.*
5. *Remind participants - No evaluation or discussion Using "round robin" or spontaneous offerings list as many possible causes as the group can generate.*

My thoughts on possible causes or things that make the problem worse:

You now have a list of possible causes of your problem to add to your symptom list. The next three exercises help you "go below the surface" to find the more fundamental causes of the problem your group is attempting to solve.

B. THE CAUSE AND EFFECT DIAGRAM
or "Fishbone Diagram"

Causes are forces that create or worsen problem symptoms. **Effects** are the consequences resulting from the causes. Practice on the exercise below. Then refer back to the sheet of symptoms you developed. Label them as Causes or Effects.

LABEL: Production worker disagrees with performance review

DIRECTIONS: Classify the following factors as either **CAUSE (C)** or **EFFECT (E).** Check the answers at the bottom of the page to see if you labeled the factors correctly.

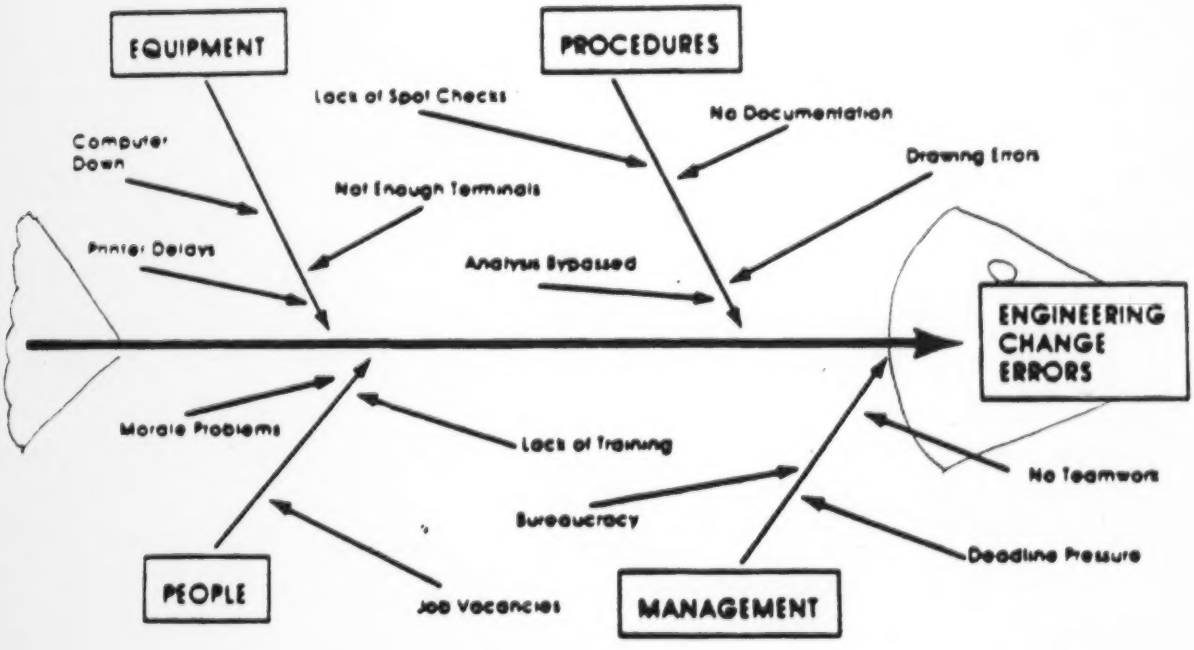
1. Heated words recently between team members. _____
2. Different methods used prior to review. _____
3. Production workers frustrated since new methods introduced. _____
4. No training in new methods. _____
5. Lack of supervision by engineer. _____
6. Name calling during review. _____
7. 280 hours to fix bugs. _____
8. No one enjoys working with consulting engineer. _____
9. Extra staff added as result of poor progress. _____
10. Engineer displayed "know-it-all" attitude. _____
11. Little user input considered in design of new method. _____

ANSWERS: The following factors were causes: 2, 4, 5, 10 and 11. The remaining factors were effects

B. THE CAUSE AND EFFECT DIAGRAM continued.

The Cause & Effect Diagram is basically a picture of a list. Each diagram has a large arrow pointing to the name of a problem. The lines off the large arrow represent categories. (Familiar? Similar to categorizing your Symptoms List.) Typical categories are personnel, equipment, materials, interpersonal, and environment. This is sometimes referred to as a "Fishbone Diagram" because it resembles the discarded skeleton after a good fish dinner. The diagram visually categorizes forces into related groups for simpler analysis.

Below is a sample problem. Notice the "head" is the problem of **Engineering Change Errors.** Major categories of problems (causes) make up the "ribs", with symptoms attached (the symptoms). Do you own "Fishbone Diagram" on newsprint or the next page.



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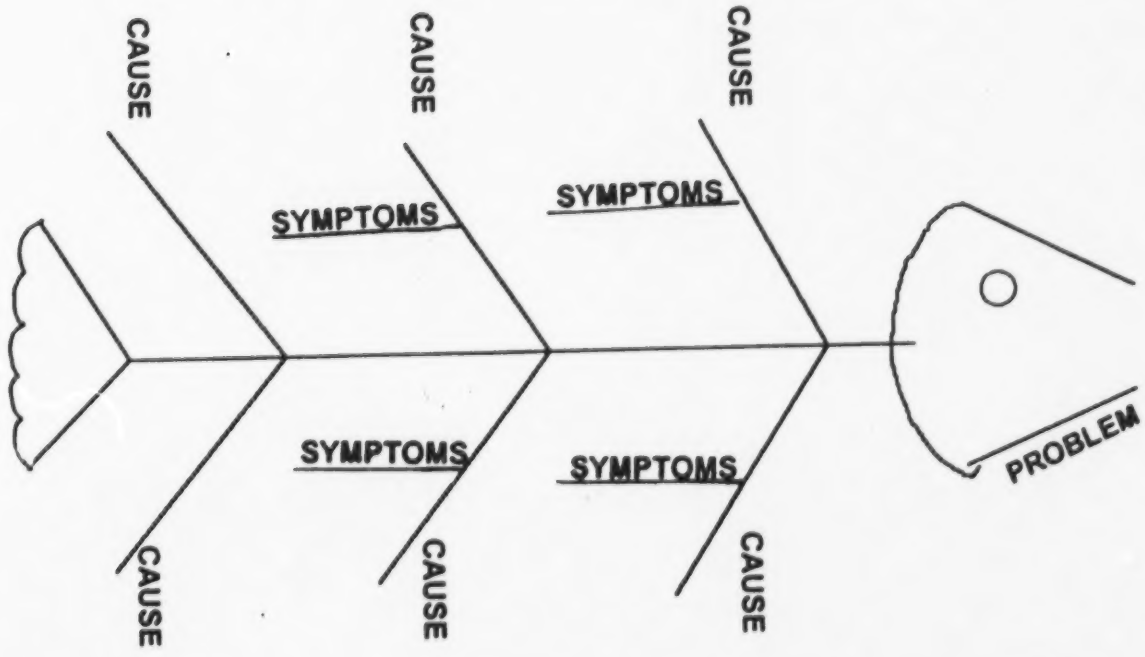
CAUSE & EFFECT DIAGRAM (FISHBONE)

Instructions:
1. Go through the Possible Causes list and identify those items that are Causes and those that are Effects. This reduces your list to more fundamental causes.
2. Go through the Possible Causes list again, writing the larger category in which the cause occurs (people, management, procedures, training, etc.).
3. Draw on the board or newsprint a long arrow (fish spine) writing the problem at the "head" of the arrow.
4. Now draw "ribs" representing each of the categories from your list. Attach the causes related to each category along each rib.
5. Again this is a "work in progress." Now that you can see the causes listed by category, are there some important causes, or even categories, that have been missed? Add them!

MY OWN CAUSE & EFFECT DIAGRAM
OR
"FISHBONE DIAGRAM"



C. REPETITIVE "WHY?" ANALYSIS

Sometimes many potential causes can be identified but there is no clear "Aha!" regarding the root. Sometimes it helps to trace the "root" of the problem. The Repetitive "Why?" Analysis separates the most fundamental causes from the less important causes. There is a sample below and worksheet on the next page.

Problem: *Irate customer on the phone*

Fifth time put on hold

Which was caused by...

Inability to get new telephone system to work as designed

Which was caused by...

Incorrect written instruction about process

Which was caused by...

Wrong instruction manual in box with new phone

Which was caused by...

Vacation replacement packers didn't have written policy to follow and inserted wrong manual in product package.

REPETITIVE "WHY?" WORKSHEET

Instructions:
1. Find one underlying factor that seems the most fundamental. Write it in the first box.
2. Ask "What caused that?" or "Why is that a problem?" until you locate the base of the chain.
3. Repeat if there seem to be other fundamental causes. Do they end in the same place, or is there a common root beyond the causes you have found?

REPETITIVE "WHY?" WORKSHEET

Which was caused by.....

Which was caused by....

Which was caused by....

Which was caused by....

D. CHRONOLOGICAL ANALYSIS

Chronological Problem Analysis helps you decide what to ignore and where to look for root causes. **Remember problems only stay solved if the root cause is fixed.** Fixing symptoms is like pulling weeds. If you don't get the root, it comes back up! This type of investigation gets at cause-effect relationships by identifying what happened before the last blow-up. Often you find an intermediate problem was actually caused by an inappropriate solution made earlier. Place your emphasis on **what,** not **who.** Remember we all get smarter with hindsight!

CHRONOLOGICAL ANALYSIS

Instructions:
1. To do a chronological analysis you need to refer to your list of causes. Put the most recent cause at the top of the worksheet below.
2. Starting from the present, list major events from your cause list and examine when each started.
3. Once you have your list, it can be summarized on a timeline.

Major Events	When did it start?

SUMMARY TIME LINE

Past **Present**

COMPLETING STEP 2

You now have taken your list of possible causes and separated cause from effect grouping related symptoms under major causes. You have also moved toward the root cause by answering the question "Why?" until you have come to underlying causes. You have also looked at the cause based on time or chronology, trying to trace back to originating causes.

THESE ARE CLUES. At the end of Step 1 you rewrote your "problem" statement. Now you can add your "cause" statement.

Instructions:

1. *Review the fundamental causes from the group analysis - - the Cause & Effect Analysis (Fishbone); the Repetitive "Why?" Analysis, and the Chronological Analysis. Have each individual write their own Cause or the Primary Causes below.*
2. *List the possibilities, identifying areas of agreement and differences. Discuss the differences and see if additional agreements are possible.*
3. *Come to a consensus about the root cause your group believes must be addressed to solve the problem!*
4. *Write it below.*

STEP 3. FINDING SOLUTIONS TO THE PROBLEM

Part I. GOAL SETTING

Before moving on to solutions, it is important to be clear what the problem looks like when it is solved! Without a full picture of the goals or target, our problem solving will be hampered. The facilitator will help you relax and move your attention inward to gain access to your mental imagery, that part of your brain that deals in "pictures," "wholes" and "reality".

Instructions:

1. Close out distractions by closing your eyes, getting comfortable, and clearing your mind.
2. Breathe slowly and let go. Imagine pushing thoughts and tension out of your body starting with your toes, up your legs, through your torso, your arms, your neck -- envision thoughts and tension leaving through the top of your head.
3. Each time you breathe you are more relaxed.
4. You see in the distance the issue, but it is in the future. It is solved. As you approach you see the results. Carefully note what conditions are in place. Make a detailed scenario in your mind of everything being the way you want it to be. There is no longer a problem.
5. Come back to the present, bringing with you a strong sense of what things will look like when they are "right."
6. Develop a scenario. Write a detailed description of how you and others will be functioning. Be specific as possible. Set your own time projection.
7. Translate your own goals and objectives from the scenario.

My scenario:

My Goals and Objectives:

Part II. DEVELOPING OPTIONS

A. BRAINSTORMING

Focus your mind on thinking up any possible strategy that has a chance to resolve the root. Be creative! Consider incredible proposals, ridiculous or unacceptable approaches, anything pertaining to resolving the underlying issue. Remember not to discuss or evaluate. Also don't forget - doing nothing is an option!

Possible target questions to serve as the focal point for this process are

"What would solve the problem?"
"What strategy could resolve the root cause?"
"What solutions have already been thought of?"
"What approaches haven't been thought of?"
"How could we stop this situation from recurring?"
"What different methods might work?"
"What crazy ideas might help?"

OPTIONS LIST

Instructions:

1. *Post and review the Problem Statement and Root Cause(s) Statement. Your solutions should be directly focused on removing the root cause.*
2. *On newsprint or the board write the heading "OPTIONS."*
3. *Also review the "Problem Description" and "Possible Causes" list. Recover any solutions that are inferred or identified during previous brainstorming sessions.*
4. *Ask members to generate their own lists of options from their scenarios and ideas that occur in reviewing the "work in progress" on the next page.*
5. *Assign a recorder to list ideas from the group.*

My ideas:

B. FORCE FIELD ANALYSIS

Opposing forces are almost always present in changing organizations. There are the restraining forces, those events, activities, factors which keep the change from happening, and driving forces, those events, activities, factors which are compelling or pushing the change to happen. It is especially useful to help identify action steps to strengthen driving forces and reduce the impact of restraining forces.

Driving Forces **Restraining Forces**

Example: **GOAL: Make sure ISO (quality standards) is good for business**

Factors that contribute (driving forces)	Factors that get in the way (restraining forces)
creates consistent process	inconsistent performance
improved some documentation and training	ISO certification for vendors not pushed
out of box failures down	unknown reason for doing ISO
raised quality awareness	justification not re-evaluated
useful to evaluate vendors	justification not communicated

Force field analysis is usually drawn as two opposing columns with the heading related to the driving forces on one side (usually positive) and the restraining forces on the other (usually negative). It is very useful, especially on tough problems where change is at the core. You may have used a process like force field analysis if you were making a decision and weighed rewards against consequences, benefits against risks, or identified resources and barriers.

FORCE FIELD ANALYSIS

Instructions:

1. *On newsprint create two columns with the following headings: Resources and Barriers.*
2. *Brainstorm in your group all the events, resources, activities and other factors that support or are pushing the change. Write these in the Resources column.*
3. *Brainstorm in your group all the events, resources, activities, and other factors that make the change difficult or might keep it from happening. Write these in the Barriers column. Note: Sometimes, but not always, there will be a barriers that off-set an item in the resource list and vice versa.*
4. *Once the force field analysis is completed, are there other solutions that may be required to incorporate resources or reduce barriers or resistance? Add any additional solutions that may be required to successfully solve the problem.*

Resources available to help solve problem	Barriers that might keep the problem from being solved

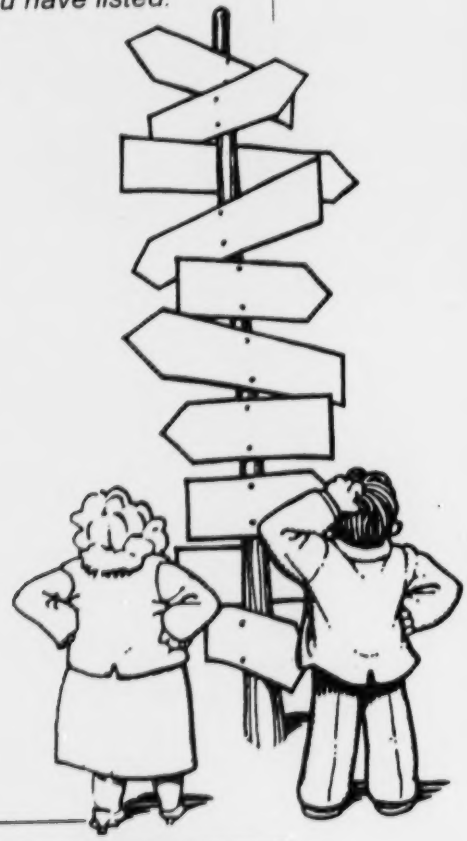
C. ANALYZING THE OPTIONS

As we did before when we generated many possibilities, we need to make some sense of our lists before we can proceed. Remember during the "Fishbone Analysis" you broke the causes of the problem into areas and grouped them under headings such as training, equipment, personnel, etc. This same type of analysis will help you organize your solutions list.

Instructions:

1. *Review the information on the brainstorming and force field analysis lists. What "themes" or "categories" are there? First list your own ideas below.*
2. *Now as a group list the possible categories (or projects) on newsprint or a board.*
3. *Now go through the lists and rewrite the possible solutions under the categories.*
4. *Note that some solutions are compatible and will work well together. Others, however, you will have to choose between the options you have listed.*

My ideas:



Part III. Evaluating the Options

The next stage is **Evaluation.** This means lining your ducks up, weeding out the worst choices, and weighing remaining choices against each other. You now have a list of possible solutions to your problem to evaluate or choose between. Your first step will be to establish boundaries for the solutions and a more specific criteria (set of standards) the solution ideally should meet.

A. ELIMINATING

Eliminating unworkable choices can reduce a long list to a manageable list. Have a brief informal discussion or brainstorming about the remaining options - why they might work or not work. You will discover that some options just won't cut it. When you delete items use specific disqualifying factors such as cost, risk, time or other boundaries that seem apparent.

SETTING BOUNDARIES

Instructions:

1. *Discuss in your group any "givens" your solution must meet. For example:*
   - *Is there a time limit the solution must meet?*
   - *Are there resource limits such as money, equipment, human resources?*
   - *Are there limitations on how much risk you want to take?*
   - *Are there other activities solutions have to fit with?*
   - *What about the company mission/goals, or your team goals? Does this effect how you evaluate the solutions?*

Note your own ideas in the space below.

2. *Go through the list and eliminate any solutions that are "outside" the boundaries you have set.*

My ideas on boundaries:

B. RANKING

Now you must select between the optional solutions. You have already been introduced to two ways to prioritize, Multivoting and Nominal Grouping. Then you were selecting a "problem area" to work on. To evaluate your choices you must first decide what criteria or standards your solution should be measured against. What factors are most important in selecting a solution: cost, timeliness, employee skills, effect on morale, worker satisfaction, higher productivity....?

RANKING

Instructions:
1. As a group generate a list of possible criteria or standards that are particularly important to any successful solution to this problem. Use the board or newsprint.
2. Using multivoting, determine your priorities among the criteria. Eliminate low priority items, keeping your list to no more than 4 criteria for this exercise. Write them in the order of their importance with the most important criteria first.
3. In the matrix below you will list your top 4 criteria across the top and your top 6 solutions down the left side of the matrix. Taking one criteria at a time, rank the solution or projects giving the best choice a 1st and the worst choice being 6th. In the last column add the rankings and divide by 6 for each solution or project. The lowest number will be your top choice.

	Criteria or Standards				
Top Six Solutions	**A.**	**B.**	**C.**	**D.**	**Aver. Ranking**
#1.					
#2.					
#3.					
#4.					
#5.					
#6.					

C. RATING

An alternative to ranking is **rating**....you know, like getting grades in school, or rating things as a + or a minus, or assigning so many points for excellent, good, average, below average, or poor.

How does rating differ from ranking? When you rank a list of items all items are valued relative to each other.

Choice	#6	#5	#3	#1	#4	#2
	1st	**2nd**	**3rd**	**4th**	**5th**	**6th**
Rank	**Best**					**Worst**

But what if several of the choices are worth considering? Some choices may end up ranked 3rd or 4th and not be considered.

The advantages of rating... If each choice was rated on its own merit:

1. You may be able to find an option that everyone in your group can support.
2. You could combine the best features of your top options.
3. You won't mistakenly discard an option that may work for you.

Choice	#6, #5, #3			#1		#4, #2				
	10	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Rating	**Excellent**									**Poor**

These approaches are only as accurate as the individual scores. Don't be surprised if the first choice stimulates some disagreement. It happens. It just means that there are factors or opinions that somehow didn't get included. Talk it out. Use more than one method. **Find the solution you can all live with.**

Remember that the primary concern is to make a firm choice that everybody buys. A "right" solution may exist, however, it will not work unless everyone is involved in the buy-in. If they support the solution, you will be able to implement the design you do in STEP 4 ACTION PLANNING. **Once your solution is chosen and agreed to, it is essential to stick with it.**

RATING

Instructions:
1. As a group generate a list of possible criteria or standards that are particularly important to any successful solution to this problem. Use the board or newsprint.
2. Using multivoting, determine your priorities among the criteria. Eliminate low priority items, keeping your list to no more than 4 criteria for this exercise. Write them in the order of their importance with the most important criteria first.
3. If the criteria are about the same importance they can be used as they are. You only need to select a rating scale - - numbers, letters, or symbols and agree on what they mean, such as A = Excellent through F = Poor or 10 = Excellent through 1 = Poor
4. If, however some items are significantly more important you will need to assign weights. For example, if effectiveness were your #1 criteria and it is twice as important as #2 cost, you would write x2 under the criteria. Then you must multiple ratings for effectiveness times 2 (effectiveness x 2). In this case it is easiest if you use a numerical rating scale.

Criteria or Standards

Top Six Solutions	**A.**	**B.**	**C.**	**D.**	**Aver. Rating**
#1.					
#2.					
#3.					
#4.					
#5.					
#6.					

Rating Scale
10 = Excellent > 1 = Poor

RESULT: STEP 3

You have listed all the possible solutions you could think of and then eliminated those that probably wouldn't work because they are too weak, too risky, or not closely aligned with your goals. Through ranking and or rating you were then able to come up with the top solutions to your problem. CONGRATULATIONS! (But don't throw out anything! You'd be surprised how useful some of the "discards" are if you get stuck when you go to implement your solution.)

Instructions:

1. *Write the top solutions you have arrived at.*
2. *Come to a consensus about the priorities among the solutions that you will be using to complete your action plan.*
3. *Write the key solutions below.*

STEP 4. ACTION PLANNING

An action plan details who will do what by when. It organizes tasks, personnel and resources. It sets up performance standards, production and quality targets. and follow-up to monitor whether the plan is being implemented and how its working.

On the next page are instructions for developing an ACTION PLAN. Worksheets follow. Remember, there is no perfect plan. View it as a road map. You will know more as you get down the road and for sure will have unexpected events. Be flexible. Improve on your plan as you go. Keep it simple, practical, and doable. The success of the plan is that it can be IMPLEMENTED.

ACTION PLANNING

Instructions:

1. *Write your overall target on the top of a piece of newsprint, something you can save and copy. The target comes from the solution(s) you have selected in the previous step.*

2. *Do a force field analysis, listing all the **resources** you have or will have to help you implement your solution on one side, and all the **barriers** or things that might keep the project from succeeding on the other.*

3. *Now you are ready to brainstorm all the **actions** that have to be taken. Don't worry about order, just get them listed. Include in the list any actions needed to obtain or use the resources and any actions required to neutralize or block barriers you have listed in #2.*

4. *Now your list is ready to be **categorized** into related groups and **arranged chronologically** - - first step, second step, etc. Sometimes actions can be grouped into projects, each with its own plan. Be sure projects fit together and don't compete for time and resources.*

5. *Review the action steps and be sure everyone has reasonably the same idea about what is going to happen. Do you have a **consensus**?*

6. *You are now ready to begin filling in an Action Plan Form. Some solutions will need to be broken into smaller projects. It may be more efficient to break into smaller groups to draft this area. The action should be specific enough to be measured and general enough to allow some flexibility in the implementation. Be sure you are realistic in you expectations. Be sure to set up "controls" - methods to see if the plan is working. Remember you want to catch problems and resolve them at early stages so you need to know what's going on.*

7. *Note the self-test at the end of the worksheets. HOW DID YOU DO?*

On the following pages are some additional tools to help you in your action planning.

1. *Write your overall target on the top of a piece of newsprint, something you can save and copy. The target comes from the solution(s) you have selected in the previous step.*

Use the space below to write out several versions of the goal of your actions. Reread the problem, cause, and solution statements. Which one best solves the problem?

Possible Target Statements:

2. *Do a force field analysis, listing all the **resources** you have or will have to help you implement your solution on one side, and all the **barriers** or things that might keep the project from succeeding on the other.*

Resources available to help solve the problem	Barriers that might keep the problem from being solved

3. *Now you are ready to brainstorm all the* ***actions*** *that have to be taken. Don't worry about order, just get them listed. Include in the list any actions needed to obtain or use the resources and any actions required to neutralize or block barriers you have listed in #2.*

Write your own ideas in the space below before contributing to the group.

My ideas about actions:

4. *Now your list is ready to be **categorized** into related groups and **arranged chronologically** - - first step, second step, etc. Sometimes actions can be grouped into projects, each with its own plan. Be sure projects fit together and don't compete for time and resources.*

5. *Review the action steps and be sure everyone has reasonably the same idea about what is going to happen. Do you have a **consensus**?*

Draft some ideas about major steps to be taken. Can the plan be broken into several projects? What are some possible sub-categories?

My ideas on major steps:

My ideas on possible projects within the plan:

6. *You are now ready to begin filling in an Action Plan Form. Some solutions will need to be broken into smaller projects. It may be more efficient to break into smaller groups to draft this area. The action should be specific enough to be measured and general enough to allow some flexibility in the implementation. Be sure you are realistic in you expectations. Be sure to set up "controls" - methods to see if the plan is working. Remember you want to catch problems and resolve them at early stages so you need to know what's going on.*

7. *Note the self-test at the end of the worksheets. HOW DID YOU DO?*

Review the following pages on MONITORING TECHNIQUES and the ACTION PLAN FORM. Note any ideas you have about what monitoring techniques might be most useful to your group. Also note which of the key actions you think should be included on the action form.

Most Appropriate monitoring techniques:

Key action items to include:

Step 4. Action Planning

Problem Solving

ACTION PLAN FORM

Date:

Overall Target:					
Action	Responsible Person	Performance Standard	Monitoring Techniques	Completion Deadline	Resources Needed
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					

COMMUNITY COLLEGES OF SPOKANE
Training & Education Coordinating Center
ITRON/WINS

MONITORING TECHNIQUES

1. Production satistics _____
2. Quality control spot checks _____
3. Personal inspection of all work _____
4. Check-in dates with team _____
5. Regular activity reports _____
6. Tickler file _____
7. One-on-one review meetings _____
8. Group staff meetings _____
9. Written questionnaires _____
10. Customer/user interviews _____
11. Checklist evaluation/audit _____
12. Grapevine _____
13. Gut feel _____

ACTION PLAN TEST

Criteria Does your Action Plan identify...	Rating Yes/No
1. Specific actions	_____
2. Clear Responsibilities	_____
3. Realistic deadlines	_____
4. Clear cut targets (performance standards and production quotas)	_____
5. Coordinated sequence of actions	_____
6. A realistic and workable system	_____
7. Checkpoints for routine follow-up	_____
8. Reliable measurement of results	_____
9. Needed personal development	_____
10. Correctly emphasized priorities	_____
11. Feasible contingency plans (for risky actions or things that might go wrong)	_____
12. Agrements workable for all involved	_____
13. A good chance of achieving the ideal scene	_____